NAME _____

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DENTAL PHARMACOLOGY
EXAMINATION # 1

February 5, 2004

You have ONE (1) hour and 15 minutes to complete this examination. The examination contains 50 questions, each worth 2 points.

Answer all questions on the computer sheet provided; use a soft lead pencil. Be sure that you have correctly identified your answer sheet by PRINTING your name and social security number and correctly filling in the grid spaces. **Please turn in your exam booklet and answer sheet at the end of the exam.** The exam booklet will be returned to you.

This examination is being administered under the Honor Code of Temple University Dental School.

Questions 1 – 50: Select the single, most appropriate answer.

1. Stimulation of alpha-2 adrenergic receptors would most likely

   A. Cause hypertension
   B. Stimulate epinephrine release
   C. Produce tachycardia
   D. Produce mydriasis
   E. Reduce norepinephrine release

2. Stimulation of muscarinic receptors would most likely produce

   A. Hypertension
   B. Tachycardia
   C. Accommodation for near vision
   D. Constipation
   E. Bronchodilation

3. All of the following are true about nicotine **EXCEPT**:

   A. Stimulates release of epinephrine from the adrenal medulla
   B. Increases sodium influx
   C. Produces hypotension and bradycardia
   D. Increases gastric acid secretion
   E. High doses may induce seizures

4. Which of the following drugs is most useful in the prevention of motion sickness?

   A. Carbachol
   B. Phenylephrine
   C. Albuterol
   D. Physostigmine
   E. Scopolamine

5. A weak base is excreted unchanged by the kidney. Which of the following will increase its rate of excretion?

   A. Reduced cardiac output
   B. Making the urine more acidic
   C. Renal disease
   D. Alkalinizing the urine
   E. Increased binding to plasma or tissue proteins

6. All of the following statements about drug administration are true **EXCEPT:**

A. The oral route is susceptible to first pass metabolism
B. Intravenous administration is useful for emergencies
C. Intramuscular administration may be used for a depot or prolonged effect
D. Sublingual administration bypasses the liver
E. Application of a drug to the skin is only useful for a localized effect, not a systemic effect

7. Regarding termination of drug action:

A. Drugs must be excreted from the body to terminate their action
B. Metabolism of drugs always increases their lipid-solubility
C. Metabolism of drugs always abolishes their pharmacologic activity
D. Distribution of a drug out of the blood terminates the drug's effects
E. Hepatic metabolism and renal excretion are two important mechanisms for terminating drug action

8. _____ is metabolized primarily by liver microsomal enzymes.

A. Tetracaine
B. Mepivacaine
C. Procaine
D. Benzocaine
E. None of the above

9. All of the following statements about local anesthetics are true **EXCEPT:**

A. Lidocaine acts on the intracellular end of sodium channels to produce local anesthetic effects
B. Among all types of nerve fibers, C fibers are most sensitive to local anesthetics
C. Benzocaine is used only for topical application
D. Local anesthetics can cause seizures at high concentrations
E. Lidocaine causes vasoconstriction and tachycardia

10. Ketamine acts as

A. An agonist at $GABA_A$ receptors
B. An antagonist at nicotinic receptors
C. An antagonist at NMDA receptors
D. An agonist at NMDA receptors
E. An antagonist at $GABA_A$ receptors

11. All of the following are true of thiopental **EXCEPT**:

A. Is classified as a barbiturate
B. The short duration of action is due to first pass metabolism by the liver
C. Is administered intravenously
D. Is useful for short procedures
E. Is a poor analgesic and thus is often used with an analgesic agent

12. The protein that couples the β-adrenergic receptor to the stimulation of adenylyl cyclase is

A. Gi
B. Gs
C. Gq
D. G12
E. G13

13. Which of the following drugs is a reversible inhibitor of monoamine oxidase (MAO)?

A. Tranylcypromine
B. Nortriptyline
C. Desipramine
D. Phenelzine
E. Amitriptyline

14. Which of the following is most likely to be responsible for amphetamine-induced increases in blood pressure?

A. Stimulation of GABA receptors
B. Stimulation of release of endogenous catecholamines
C. Metabolism to false neurochemical transmitters
D. Inhibition of catecholamine metabolism
E. Beta-2 adrenergic receptor agonism

15. Which of the following drugs best controls the manic phase of bipolar depression?

A. Doxepin
B. Fluoxetine
C. Paroxetine
D. Lithium
E. Protriptyline

16. Clinically used, effective bronchodilator:

A. Albuterol
B. Prazosin
C. Benztropine
D. Metoprolol
E. Bethanechol

17. Increased secretion of prolactin (as a side effect) is most likely to be associated with which of the following psychotropic agents?

A. Imipramine
B. Olanzapine
C. Risperidone
D. Clozapine
E. Haloperidol

18. Which of the following drugs is most useful for the induction of anesthesia?

A. Dantrolene
B. Midazolam
C. Isoproterenol
D. Imipramine
E. Bromocriptine

19. All of the following statements apply to phenylephrine **EXCEPT**:

A. Is primarily a direct-acting alpha-adrenergic receptor agonist
B. Reverses hypotension during anesthesia
C. Reduces secretions by inhibiting parasympathetic stimulation
D. Constricts small vessels in the nasal mucosa
E. Causes mydriasis, without cycloplegia

20. All of the following statements concerning buspirone are true **EXCEPT**:

A. Lacks muscle relaxant activity
B. Acts as a partial agonist at serotonin receptors
C. Is used in the management of generalized anxiety disorder
D. Has a quick onset of therapeutic action (within 1-2 days)
E. Is a member of the azaperone class of anxiolytics

21. A cardioselective adrenergic receptor blocker:

A. Timolol
B. Atenolol
C. Propranolol
D. Phenoxybenzamine
E. Bethanechol

22. Approved for use in the management of children with attention-deficit hyperactivity disorder:

A. Dobutamine
B. Methoxamine
C. Amphetamine
D. Pseudoephedrine
E. Paroxetine

23. An inverse agonist at the benzodiazepine binding site would tend to cause which one of the following actions?

A. Sedation
B. Agranulocytosis
C. Convulsions
D. Muscle relaxation
E. Psychotic episodes

24. Which of the following antiepileptic drugs is most likely to cause hepatic failure as a serious side effect?

A. Phenytoin
B. Valproic acid
C. Ethosuximide
D. Carbamazepine
E. Clonazepam

25. Selegiline is used in the treatment of Parkinsonism. It alleviates the symptoms of this motor dysfunction by

A. Acting as a D-1 dopaminergic receptor agonist
B. Releasing stores of endogenous dopamine
C. Inhibiting dopa decarboxylase activity
D. Acting as a muscarinic receptor antagonist
E. Inhibiting MAOb activity

26. The combination of levodopa plus carbidopa (Sinemet) is used in preference to levodopa alone in treating Parkinsonism because

A. Carbidopa elevates the amount of plasma dopamine
B. The need to use supplemental acetylcholine agonists is eliminated
C. The need to use supplemental dopamine antagonists is eliminated
D. It decreases the breakdown of levodopa in the peripheral circulation
E. Carbidopa releases GABA

27. Identify the pure non-depolarizing neuromuscular blocker that produces the least release of histamine and has minimal effect on the cardiovascular system:

A. Benzoquinonium
B. Metocurine
C. d-Tubocurarine
D. Vecuronium
E. Succinylcholine

28. Nausea that results when alcohol is ingested after disulfiram has been taken is due to an increase in blood

A. Acetaldehyde
B. Acetone
C. Formaldehyde
D. Formic acid
E. Ethylene glychol

29. Triazolam has a half-life of approximately

A. 2-4 hours
B. 5-10 hours
C. 20-30 hours
D. 30-60 hours
E. 50-100 hours

30. The benzodiazepines act at the GABA-ionophore to

A. Increase the duration of the IPSP at the postsynaptic cell
B. Increase the amplitude of the IPSP at the postsynaptic cell
C. Decrease the duration of the EPSP at the postsynaptic cell
D. Decrease the amplitude of the EPSP at the postsynaptic cell
E. Benzodiazepines have no effect on the IPSP or the EPSP

31. A drug that is rapidly and completely absorbed is given in a dose of 100 mg. The half-life of the drug is 4 hours. After 8 hours, the quantity remaining in the patient is

A. 2 mg
B. 4 mg
C. 12.5 mg
D. 25 mg
E. 50 mg

32. It is desired to rapidly achieve a plasma concentration of 0.2 mg/L for a drug whose apparent volume of distribution is 50 L. The initial loading intravenous dose should be

A. 4 mg
B. 8 mg
C. 10 mg
D. 20 mg
E. 100 mg

33. The competition between an active and an inactive drug for the same receptor (e.g., phentolamine and norepinephrine on vascular smooth muscle) represents a drug interaction termed

A. Pharmacological antagonism
B. Functional antagonism
C. Chemical antagonism
D. Synergism
E. Additivity

34. Stimulation of which of the following receptors is most likely to produce relaxation of bronchial and uterine smooth muscle?

A. Muscarinic
B. Dopaminergic
C. Beta-1 adrenergic
D. Beta-2 adrenergic
E. Alpha-2 adrenergic

35. Which of the following drugs increases the outflow of aqueous humor in the treatment of glaucoma, and is also useful in the treatment of xerostomia?

A. Pilocarpine
B. Timolol
C. Clonidine
D. Tropicamide
E. Albuterol

36. A patient has taken an overdose of atropine. Which of the following symptoms is **LEAST** likely to be observed?

A. Constipation
B. Xerostomia
C. Blurred vision
D. Bronchoconstriction
E. Flushed skin and fever

37. Which of the following drugs is most likely to produce tachycardia?

A. Atropine
B. Atenolol
C. Propranolol
D. Bethanechol
E. Clonidine

38. Aspirin is a weak acid with a pKa of 3.5. What percentage of a given dose will be in the lipid-soluble non-ionized form at a pH of 2.5?

A. About 1%
B. About 10%
C. About 50%
D. About 90%
E. 100%

$3.5 - 2.5 = \log \frac{NI}{I}$

$\frac{10}{1} = \frac{NI}{I}$

39. All of the following statements about local anesthetics are true **EXCEPT**:

A. In infested tissues where extracellular pH is low, ropivacaine is less effective than in uninfected tissues
B. Patients who are allergic to tetracaine are likely to be allergic to procaine
C. Tetracaine is more lipid-soluble and has a longer duration of action than procaine
D. Cocaine has local anesthetic properties
E. The purpose of including epinephrine in lidocaine preparations is to increase its lipid solubility

40. Which of the following effects is common to all the inhalational general anesthetics with the exception of nitrous oxide?

A. Hepatotoxicity
B. Uterine smooth muscle relaxation
C. Depression of cardiac output
D. Seizures
E. Airway irritation

41. Given the following information concerning general anesthetics, which drug will induce anesthesia at the fastest rate if given at the MAC concentration?

		MAC	Blood: Gas Partition Coef.
A.	Drug A	23.0	1.5
B.	Drug B	12.0	1.0
C.	Drug C	5.0	14.0
D.	Drug D	1.0	6.0
E.	Drug E	0.2	4.0

42. Which of the following belongs to the tyrosine kinase family of receptors?

A. $GABA_A$ receptor
B. Beta-adrenergic receptor
C. EGF receptor
D. Nicotinic receptor
E. Muscarinic receptor

43. Which statement best describes a characteristic of halothane?

A. Is totally excreted unchanged and thus is not hepatotoxic
B. Is a weak anesthetic, not useful for stage 3 anesthesia
C. Is a depressant of respiration
D. Is administered intravenously
E. Is largely distributed to adipose tissue

44. All of the following statements apply to propranolol **EXCEPT**:

A. Is a competitive antagonist of beta-adrenergic receptors
B. Is contraindicated in patients with bronchial asthma
C. Is used for the prophylactic management of migraine headache
D. Is used for the prophylactic management of angina pectoris
E. Possesses low lipid solubility

45. All of the following statements apply to chlorpromazine **EXCEPT**:

A. Causes orthostatic hypotension
B. Stimulates histamine receptors
C. Blocks dopamine D-2 receptors
D. Blocks muscarinic receptors
E. Is a member of the phenothiazine class of antipsychotic agents

46. Flumazenil reverses the behavioral depressant effects of which of the following drugs?

A. Morphine
B. Thioridazine
C. Phenobarbital
D. Haloperidol
E. Diazepam

anybenzo
everytest

47. Which of the following drugs would be most effective for controlling seizures associated with status epilepticus?

A. Topiramate
B. Haloperidol
C. Ethosuximide
D. Lorazepam
E. Gabapentin

absence seizures

48. Phase II block at the neuromuscular junction occurs when succinylcholine

A. Releases excessive amounts of histamine
B. Is used in combination with d-tubocurarine
C. Is used in a patient who has recently engaged in excessive muscular activity
D. Is used in a patient who has had excessive bed rest
E. Is used for a prolonged period and in excessive amounts

49. Which effect is most likely to occur with chronic alcohol ingestion?

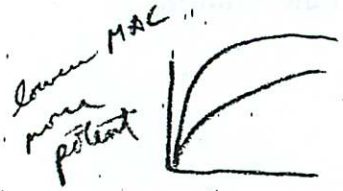
Decr

A. Enhanced synthesis of antidiuretic hormone
B. Decrease in high density lipoproteins
C. Cutaneous vasoconstriction
D. Lesions of the myocardium
E. Decreased fat production in the liver

Fatty liver

50. The potency of a drug is indicated by which of the following terms?

A. ED50
B. E_{max}
C. Clearance
D. Receptor concentration (R_t)
E. Half-life



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